

WILLIAM AITCHESON HASWELL.

1854-1925.

(*Memorial Series, No. 1.*)*

(With Portrait.)

One of a large family of an Edinburgh banker, Haswell was born at Gayfield House, Edinburgh, on the 5th August, 1854. While other members of the family showed ability in art and music he, in early life, displayed a preference for quiet reading. His school was the famous Edinburgh Institution, whence he proceeded at a comparatively early age to the University of Edinburgh. Here, at this time, by a happy coincidence, an extraordinary combination of some of the most brilliant teachers of the period found in young Haswell an eager and responsive student, who showed unusual aptitude in these spacious intellectual pastures. After winning high distinction in widely different subjects, he fitly completed a great University career in 1878 by graduating as B.Sc. and by winning the Bell-Baxter Scholarship awarded to the most distinguished Natural Science student of his year. He had already graduated as M.A., and in 1887 he achieved his D.Sc.

His friend and former colleague, Professor J. T. Wilson, writes: "It must be regarded as a fortunate circumstance that Haswell's period of training in Natural Science coincided with Professor Huxley's temporary occupation of the Chair of Natural History in Edinburgh. He thus came under the scientific and personal influence of that great master of animal morphology".

He studied zoology under Wyville Thomson and Huxley; geology under Sir Archibald Geikie, of whose class he was medallist; surgery under Lord Lister.

His earlier intention appears to have been to follow medicine as a profession, but even the greatest of surgeons could not induce any deviation from the path set by him in the later years of his University life, and his love of Natural History drew him irresistibly to a scientific career. "There can be no doubt", says Professor J. P. Hill, "it was the teaching of Wyville Thomson and Huxley that gave Haswell that bent for marine zoology that characterized him throughout his life". A friend and fellow student at Edinburgh was Lord Haldane, with whom he studied Mental Philosophy and Logic, and with whom he used to take long walks.

According to Lord Haldane, Huxley discovered his conspicuous aptitude in zoology and took much notice of his work. Lord Haldane himself describes the Haswell of that period as a man of real mark, very accurate and devoted to study and interested in knowledge in many forms. "These early characteristics were precisely those which, within my knowledge of the writer during a long association, remained throughout as the outstanding and distinctive qualities of a greatly esteemed colleague".

* The Memorial Series will comprise memorials prepared, from time to time, under the direction of the Council, of distinguished Members of the Society who have died.—ED.

Professor W. L. McIntosh, of the Marine Laboratory, St. Andrew's, in a recent letter to Mrs. Haswell relates the following: "Professor Haswell when a young graduate in Edinburgh and I happened to meet after a celebrated professor's lecture, and he came to me and said: 'Did you notice that Prof. ——— gave the wrong number of vertebrae to a certain specimen?' He was quite right and from that date his wonderful accuracy and acuteness were characteristic to the end. The same care characterized his drawings."

But all the branches of Natural Science, together with Mental Philosophy and Logic, were not enough to satisfy this avid assimilator of learning. Besides winning seven University medals Haswell also won the prize poem of his year on the subject of the "Death of Livingstone".

Amongst the many letters from his Edinburgh teachers is one from Professor P. G. Tait, who states that Haswell was in "Natural Philosophy" "first, with another, the highest place in a very strong year."

Sir Archibald Geikie also wrote of his geology: "You carried everything before you in my class and, what is more, you earned the affectionate remembrance of your class fellows and teacher. In an excursion I had abundant opportunity of cultivating your personal acquaintance and I was led to form the highest opinion of your attainments."

Professor Sir J. Wyville Thomson wrote: "I have the great pleasure in recommending my friend and former pupil, Mr. Haswell, for any appointment connected with Natural Science. Mr. Haswell is an excellent Naturalist, both theoretical and practical and an accomplished and thoroughly reliable gentleman."

Typically characteristic of the adult Professor was the reticent attitude of this modest young prize winner. Only through public notices or through friends did his own family hear of these successes, for he himself would never speak of them. During his longer vacations he found time to travel to some extent through Europe, and to study in Germany. He apparently missed the summer term of 1877 to attend a course in zoology, anatomy, petrography and histology at Leipzig University, a certificate of which is amongst his papers. Once also he went to America. But with a not over-strong physique the strain of this work was telling on him, and, by way of recuperating his health after taking his degree in 1878, he sailed for Australia.

Here he was almost at once welcomed by Sir William Macleay—always on the look out for men through whom, or means by which, he could advance his beloved Natural History. Just as eagerly did the young zoologist respond—scarcely seeming to understand the word holiday or only interpreting it in a way commonly found with men of great mental activity, as change of occupation. Huxley, during his memorable voyage in "*the Rattlesnake*" spoke of Port Jackson as affording an ideal and prolific region for the marine biologist. It is certain that Haswell must have had this in his mind at this period. At any rate with Sir William Macleay's help and encouragement a small marine zoological laboratory was established in a hut at Watson's Bay, and here Haswell initiated that long series of researches that only came to an end with life itself. The collections resulting from the "Chevert" Expedition to New Guinea were being examined and Haswell took a willing share in working on this material. Thus, too, came about the beginning of a long association with this Society, his first contribution being "A description of six new species of Annelids". This paper was read on 25th November, 1878, but his actual presence at the meeting is not recorded. Nor is there any record of any official employment until his appointment as Curator



W. A. Haswell.

of the Brisbane Museum in December, 1879, but during the previous twelve months he contributed no less than nine papers to the PROCEEDINGS of this Society besides two to the *Annals and Magazine of Natural History*, chiefly on widely different branches of marine zoology.

Professor Hill writes of this period: "Young and enthusiastic, Haswell threw himself with great energy into the study of the rich marine fauna of Port Jackson and the adjacent coasts, and in the course of a few years published in the Proceedings of the Linnean Society of N.S.W., numerous papers, mainly of a systematic character, on the Crustacea, Annelida and Bryozoa of the Australian seas. In particular we owe to him the first description of the giant *Phoronis* that occurs in Port Jackson and which he named *Ph. australis* in 1882. Later in the same year he exhibited drawings of the early stages of its development to the Linnean Society. During this period, however, he by no means confined himself to the systematic Zoology of the Invertebrata, but contributed papers of value to the Linnean Society on such diverse subjects as the anatomy of birds, the structure of the paired fins of *Ceratodus*, the skeleton of Elasmobranch fishes, and the early stages in the development of the Emu. In 1886 he described in the *Quarterly Journal of Microscopical Science* the remarkable striate muscle fibres in the wall of the "gizzard" of *Syllis*, and in 1889 he published the results of a comparative study of the same fibres, in the course of which he described certain remarkable relations between the nerve cells related to them which were of very great interest from the point of view of the neurone theory, and which well deserve reinvestigation. In 1888, also in the *Quarterly Journal of Microscopical Science*, he gave the first detailed account of the anatomy of that interesting ectoparasitic Trematode, *Temnocephala*, a form which will always be associated with his name."

Professor Wilson adds similar testimony "of the scope of his investigations and the catholicity of his interest in the animal kingdom."

Haswell was present as a visitor at the January meeting, 1879, of this Society and was elected a member on April 30th of that year. From January to November of the following year he was at the Brisbane Museum, from which he resigned under the strong inducement to carry out work nearer to his heart.

At the annual meeting of the Linnean Society of New South Wales, 27th January, 1881, Haswell was elected a member of the Council of the Society, on which he served with the greatest regularity till his death. In this year, following the example of Darwin, Huxley, Hooker and Murray in their zeal for first hand knowledge by travel, and metaphorically following the wake of "H.M.S. *Rattlesnake*", Haswell seized on the opportunity afforded by the invitation to join "H.M.S. *Alert*" on a surveying cruise to the Great Barrier Reef. It is regrettable that Haswell himself recorded so little of the incidents of the voyage, but, always a good sailor, he must have revelled in this occasion to study—all too briefly—this illimitable wonderland of marine life. In "Four years in Patagonian, Polynesian and Muscarene Waters, 1878-1882", by R. W. Coppinger, Staff-Surgeon, R.N., C.M.Z.S., p. 180, this reference occurs: "On leaving Sydney we received a welcome addition to our number in the person of Mr. W. A. Haswell, a professional zoologist, residing at Sydney, who expressed a wish to accompany me as far as Torres Strait in order that he might have the opportunity of studying the Crustacean fauna of the east coast of Australia. He was consequently enrolled as an honorary member of our mess, and Captain Maclair kindly accommodated him with a sleeping place in his cabin. I am indebted to Mr. Haswell for much valuable information concerning the marine zoology of Australia."

On his return he carried out an engagement to Sir William Macleay—who thus showed his thorough appreciation of the brilliant young naturalist—by giving a series of twenty lectures on Zoology at the Garden Palace under the auspices of the Linnean Society of New South Wales.

In 1882 he was appointed Demonstrator in Comparative Anatomy, Physiology and Histology in the University of Sydney; the title being changed in November, 1884, to Lecturer in Zoology and Comparative Anatomy and Demonstrator in Histology. Always interested in the Australian Museum he published that year a valuable Catalogue of the Australian Stalk- and Sessile-eyed Crustacea and, during the absence of Dr. E. P. Ramsay from March, 1883, to February, 1884, he was Acting-Curator of that Institution. On the 3rd February, 1891, he was elected a member of the Board of Trustees of this Museum, in which capacity he gave his valuable services until his resignation in December, 1923.

“Such was the reputation Haswell had established for himself as an original investigator and teacher that the Senate of the University, when the Challis Professorship of Biology was instituted in 1889, offered him the Chair, and this he held continuously until his retirement in 1917” (J. P. Hill). The title was, however, altered to that of Professor of Zoology in 1914, on the appointment of a Professor of Botany. On his retirement the Senate of the University conferred on him the honoured title of Professor Emeritus. During his tenure of the Chair, he three times obtained leave of absence from the University of Sydney for the purpose of visiting many European Universities as well as those of England, Scotland and Wales.

In 1891 the Australasian Association for the Advancement of Science held its biennial meeting at Christchurch, New Zealand. Haswell was President of the Biological Section and thus came into intimate contact with Professor T. Jeffery Parker with whom he formed a close friendship, leading to their joint authorship of the famous Text-book. Of importance, too, was the meeting which followed with a gifted young pupil of Professor Parker, Josephine Gordon Rich, co-author with her teacher of a paper on the Myology of *Palinurus*. Miss Rich was a cousin of his friend, Lord Haldane. Quite naturally Haswell became the guest, then and during following visits to New Zealand, of her father, W. Gordon Rich, at his beautiful home, Toi-Toi. Just as naturally, too, this friendship, commenced through, cemented by, and continued in congenial tastes, led in 1894 to the happiest of marriages and real life mateship, for Mrs. Haswell to the end took the keenest and most sympathetic interest in the work of her husband, generally accompanying him on his expeditions and on his two forms of relaxation, trout-fishing and golf. Mrs. Haswell also contributed a valuable share to the drawings of the Text-book of Zoology.

Not the least of Haswell's legacies to the University of Sydney was the Zoological Museum founded by him and continually developed throughout his career as a valuable supplement to the oral and written work of his teaching. Many visiting teachers from German and other Universities have paid tribute to the high standard and value of this Museum.

“Outside the ranks of professional zoologists Haswell is perhaps best known to the scientific world as the joint author, with his staunch friend the late Professor T. Jeffery Parker, of the monumental Text-book of Zoology”, now (1928) in its 4th Edition, “which was first published in 1898 after several years of unremitting toil on the part of the authors” (J. P. Hill). This has become the standard text-book in the English language; and it is used extensively and highly appreciated in America as well as throughout the British Empire. Owing

to Professor Parker's death shortly after the publication of the original edition, the second (1910) and the third (1921) editions were entirely prepared by Haswell; as was also the abridged "Manual of Zoology" first published in 1899 and reprinted in 1908, 1913 and 1918. The fourth edition of the Text-book was issued in 1928. This contains 1,536 pages in two volumes, and includes valuable supplements on Distribution (23 pp.), Philosophy of Zoology (24 pp.), and History of Zoology (22 pp.).

"The Text-book is a monument of scholarship and is apt to disconcert the unwary student who, deceived by the ease of its English, fails to realize the compression of its matter throughout." (R. H. Cabbage).

The late Professor Launcelot Harrison wrote in 1926 of this work: "It has maintained its pre-eminence for nearly thirty years. To the zoological confraternity in the United States the University of Sydney was known as Haswell's University." Then in discussing the future of Zoology he wrote: "The trend of Zoology is changing. The experimental method, still in its infancy, is making rapid strides and its results are so important that they, together with recent advances in physiology, must largely replace the pure morphology of current text-books. But 'Parker and Haswell' will always hold its place as an Encyclopaedia of Morphology and Comparative Anatomy to which the zoologist must refer, just as he still refers to the ancient Owen's 'Comparative Anatomy of Vertebrates' for facts which are not otherwise easily accessible." The wide use and appreciation of the "Text-book of Zoology" is further indicated by its translation into Russian by M. A. Menstier (Moskva, 1908). A characteristic act of self-denial and chivalry towards his late co-partner in authorship occurred in connection with the publication of the "Manual of Zoology" and explained in Professor Haswell's own preface to that work as follows: "Owing to the lamented death of Professor T. Jeffery Parker, at a time when but little progress had been made with this work, his actual share in it has been but slight: but the general plan of the work was arranged between us, and the earlier parts had the advantage of his revision, and more especially as this smaller manual owes a great deal to his work in the "Text-book", it has been thought right to let the present work appear under our joint names as originally intended." By this chivalrous act Haswell received a considerably curtailed income from the proceeds.

The Linnean Society of New South Wales will always hold Professor Haswell in grateful memory. He was its President for the years 1891-1893, and his Presidential Address was memorable for his suggestion of the Macleay Memorial Volume, a suggestion at once adopted, and followed up by its publication in 1893, and to which he himself contributed. He was the intimate friend of Sir William Macleay during the later years of Sir William's life and—next to the late J. J. Fletcher—was probably closest in touch with him in discussing his ideas of endowments. Haswell also contributed to the welfare of this Society by a service of forty-three years on its Council and by a continuous series of papers published in its Proceedings. As stated above, his first paper "On six new species of Annelids" was read in November, 1878, his last, "Critical notes on the Temnocephaloidea" in November, 1924, only two months before his death. During these forty-six years he contributed no less than seventy-four papers, in addition to one in collaboration with Professor J. P. Hill. These include for their subject matter, almost every group in the animal kingdom and even one botanical paper, "Notes on *Tmesipteris* and *Psilotum*". He also wrote several papers that were read at the several biennial meetings of the Australasian Association for the Advancement of Science and published in their Reports, and

one, at least, "On the question of the occurrence of living organisms in the Artesian Waters" in the *Journal and Proceedings of the Royal Society of New South Wales*.

On the occasion of the visit to Australia of the British Association for the Advancement of Science in 1914 he contributed to the Federal and the New South Wales Hand-books, editing the Zoological Sections of the latter. During his last few years, in addition to his own research work he edited the reports of the Australasian Antarctic Expedition, issued by the Government Printer at Sydney. Outside Australia Haswell contributed widely to British and European scientific journals. These include the *Annals and Magazine of Natural History*, the *Quarterly Journal of Microscopical Science*, the *Transactions of the Linnean Society of London*, the *Zoologische Anzeiger* and others.

The Crustacea and the Polychaete Annelids constituted his chief systematic interest and he returned to the latter group after his retirement from the Challis Chair, publishing two papers on Syllids in 1920. But his papers deal with almost every Phylum, from the Protozoa (parasitic Euglenoids and colonial Radiolaria) to the Mammalia (brain of Gray's whale). The paired fins of *Ceratodus*, the myology of pigeons, the embryology of the emu, attracted his attention amongst the vertebrates, but there is no doubt that he was primarily an invertebrate zoologist, and that of the invertebrates the Platyhelminths held most interest for him. He wrote a number of papers on the Turbellaria, Trematoda and Cestoda. Possibly arising out of his early interest in Crustacea, he made a special study of the Temnocephaloidea, parasitic upon the Australian freshwater crayfishes. He monographed the group in the Macleay Memorial Volume (1893), studied its embryology, after overcoming very great technical difficulties (*Quart. J. Micr. Sci.*, 1909) and was, at the time of his death, engaged upon its revision. He discovered and described two of the five known species of Histriobdellids, for which he proposed a genus *Stratiobdillus*, and here again he included in his research a study of the embryology.

Professor Haswell invariably collected the material for his own researches in the first instance, although he might invite distant colleagues to gather material for comparison. He did all his own technical preparation, never seeking any help from his staff and, with few exceptions, made his own drawings. Up to the time of his retirement from the University his working day, after the morning lecture, or lectures, was spent immured in his private laboratory. His industry continued to the end, and he was working on a detailed study of the eyes of *Temnocephala* up to the time of his fatal seizure.

He was elected a Fellow of the Royal Society in 1897 and was also a member of various other learned Societies in Great Britain and other countries. In 1915 he was awarded the Clarke Medal by the Royal Society of New South Wales. Outside Australia, then, Haswell was best known as the author of the Text-book and for his numerous and valuable researches. But throughout Australia his name will live long as an inspiring teacher of a second generation of zoologists. On this subject the words of his own student pupils are fitting. The late Professor Launcelot Harrison wrote in his "appreciation": "I first attended his lectures in 1911 as a somewhat elderly undergraduate. My first impression of him remains that of a little man with invulnerable dignity, a nervous manner, and a difficult utterance, which to some extent marred the scholarship of his lectures. For these were scholarly. He was a master of the English language, and although he lectured almost entirely without notes, I never caught him tripping over the composition of even complicated sentences. Apart from lectures we students saw little of him. He never came into the

laboratories in my time, and all practical work was left to his junior staff. As a senior student, however, it was my occasional privilege to take in to him some of the more exciting of my mild discoveries in the field, and at these times his punctilious courtesy and kindness of manner; as well as the keen interest with which he discussed the material I brought, gave me an insight into the real character of the man. I was to learn all this much better, however, at a later date, when, under painful circumstances, I found myself in charge of the department over which he had so recently presided. I knew him so little that I felt he would be as appalled as I was at my temerity in attempting to occupy his vacated place. But I found him all kindness and sympathy, and he seemed to be confident that graduates of his training should be able to hold any place. Moreover, he treated me as a colleague on an equal footing, which was as precious in some ways as it was embarrassing in others.

"The younger Haswell I never knew. One story arises out of the past which goes to show that under that reserved Scotch exterior there lay a certain subtlety of humour. The professor's room in the old Zoology Department looked out upon a courtyard in which, one fine morning, Haswell observed two of his students dressing a dog in fine raiment, for the purpose of bringing it into lecture. It duly appeared and, much to the surprise of the originators of the enterprise, Haswell called upon them by name and fined each of them a pound. A third student, who considered himself a bright lad, suggested to the crestfallen conspirators a method by which the fines might be halved. He would go to the professor and confess to having been the sole author of the outrage. He would be fined a pound, the others being let off and they could then each pay ten shillings. All went according to plan up to a point. The student confessed and was fined a pound. He then asked what of the others. The reply came: 'I have already fined them a pound. Good morning! Mr. So-and-So'."

Perhaps the best estimate of the worth and work of a University Professor may be drawn from the positions occupied by the men he has trained. Two of Haswell's graduates have successively occupied his own Chair at the University of Sydney, while others fill chairs in the Universities of Queensland, Tasmania and Adelaide. In addition, Professor J. P. Hill, of University College, London, received most of his training under Haswell at Sydney. Of what other professor in any Australasian University can so much be said?

To this list may be added the names of Dr. R. J. Tillyard, F.R.S., who always spoke warmly of his great debt to Haswell's teaching and help, and Dr. H. L. Kesteven, D.Sc., M.D. The latter writes: "I had always the greatest admiration and respect for Professor Haswell. He was a man of few words and did not encourage his students to seek his assistance. On the other hand, once one had succeeded in getting beyond his reserve, and I believe that this could only be achieved by proving one's earnestness in research and need of his aid, one was more than rewarded. Throughout the years of my studentship I saw little of the Professor. After graduating, however, I took my problems to him and discovered a keen, inspiring teacher and colleague. All the old reserve had gone. He analysed my evidence with me, weighing point by point, suggested further lines of investigation and encouraged me to continue. Professor Haswell was a poor conversationalist, unless really interested in his subject; he had no small talk, but I was always struck by the clarity and appositeness of his remarks when once he did get under way. I do not think that I have ever listened to anyone whose voice and words conveyed so much in so few words. I have still on my shelves a complete transcript of his lectures on the anatomy

and development of the vertebrata as nearly in his own words as it was possible to get them down in long hand. That transcript might be sent to the printer without any editing; and the Professor lectured from brief headings on a single little card.

"Only once do I remember to have seen Professor Haswell unbend completely. We were on a deep sea dredging trip off the entrance to Port Jackson. Twenty miles out, with over a thousand fathoms of line down, we were struck by a Southerly Buster. For a while the excitement ran high. Would we have to cut the dredge adrift, or could the skipper hold the boat against it whilst we hauled in? Everyone on board except the Professor was suffering badly from mal-de-mer but he appeared to be absolutely in his element. The scientific members of the expedition were Hedley, Haswell, Hill, McCulloch and myself and the Professor was the life of the party."

Professor J. T. Wilson writes: "As a University Teacher Haswell's work was marked by the same accuracy and thoroughness which characterized all his efforts. Although somewhat cold and undemonstrative as a lecturer, he was perfectly lucid and logical in statement. In the entire absence of all oratorical emphasis he succeeded in inspiring the serious student with something of his own enthusiasm, and thus in establishing a school of zoology which has provided the occupants of various zoological chairs and lectureships. Nor was his influence as a zoologist confined to the classroom and laboratory. As Councillor and some time President of the Linnean Society of N.S.W., as a member of the board of management of the Australian Museum, and in various other local scientific capacities Haswell exerted a potent influence for the furtherance of zoological interests in the community. On the various University Boards he was a trusted adviser, sparing of speech, but candid and just and fearless in his opinions.

"Underneath his somewhat reticent and shy demeanour Haswell concealed a most genial and kindly disposition. Those who had the privilege of some degree of intimacy with him could not fail to appreciate and admire the fineness of character and the breadth of culture, literary and artistic as well as scientific, which were essential elements in the composition of his calm and unobtrusive personality."

Another colleague says of Haswell: "Beyond his own particular branches of study he had a knowledge and appreciation of literature and philosophy that, when his initial shyness was overcome, made him a profitable companion to those in other walks: and mere acquaintances could not but be struck by his sterling honesty and worth."

His chief recreations were trout-fishing, gardening and golf. An expert fly fisher—perhaps the only sport of his younger days—he used regularly to visit the South Island of New Zealand during the summer recess to indulge his favourite pastime. He played golf and derived great pleasure from tending his garden at Woollahra Point, overlooking a beautiful part of Sydney Harbour. Indeed his knowledge of both theoretical and practical horticulture was unusually wide and he was always greatly interested in the artistic as well as in the productive possibilities of his grounds. Of course botany was a part of his biological equipment, but far beyond the academic regions of the subject he had the familiar intimacy with the minutiae of the native flora only acquired by the natural naturalist, aided by a tenacious memory. In his younger days he was fond of long walks, but about 1900 he was one of the earlier Sydney patrons of the

motor car which he used for his daily journey to the University; and the memory of which the writer cherishes as his own first experience of motor carriage.

Professor Haswell leaves a wife and an only daughter to mourn his loss.

To us, late fellow members with him—and others—he leaves a precious record

of *diligence*—in his accomplished tasks,
of *bravery*—in facing their magnitude,
of *modesty*—in his quiet reticence,
of *sincerity and honesty*—in his fearless following of what seemed to him
highest and best.

Haswell represents to us the embodiment of that wide culture that was the result of the combination of the study of Arts and Science in his ancient University, interwoven with the fibres of a character inherited from a fine race—a culture that in the words of Huxley “implies the possession of an ideal, and the habit of critically estimating the values of things by comparison with a theoretic standard.”

He takes his last rest in the Waverley Cemetery, within view of, and almost on the shores of that great Pacific Ocean whose mysteries he loved to explore, and from which he interpreted so many things previously hidden. Like Newton he was content to wander along the strand of life, here and there picking up a stray shell of truth from the myriads that lay around him

“Nor paused till in the westering sun
To sing because his task was done.”

Other obituary notices utilized and largely embodied above are:—

Prof. J. P. HILL—Obituary Notice of W. A. Haswell (with portrait) in *Proc. Roy. Soc. Lond.*, 1925.

Prof. J. T. WILSON—Obituary Notice in *Proc. Linn. Soc. Lond.*, 1924-25.

R. H. CAMBAGE—Presidential Address, *Proc. Linn. Soc. N.S.W.*, 1, 1925, Pt. 1 (April, 1925).

Prof. L. HARRISON—“An Appreciation” (*Sydney Morning Herald*), February 9, 1925).

H.J.C.

LIST OF PAPERS BY W. A. HASWELL.

1879.

- On six new species of Annelids belonging to the Family Amphinomidae. PROC. LINN. SOC. N.S.W., iii, 1878 (1879), 341.
- On two new species of Crabs of the genus *Stenorhynchus*. PROC. LINN. SOC. N.S.W., iii, 1878 (1879), 408.
- Notes on the Anatomy of Birds. i. The Brachial Plexus of Birds. PROC. LINN. SOC. N.S.W., iii, 1878 (1879), 409.
- Notes on the Anatomy of Birds. ii. The Lumbar and Sacral Plexuses of Nerves. iii. The Myological Characters of the Columbidae. PROC. LINN. SOC. N.S.W., iv, 1879, 303.
- On the Australian species of *Penaeus* in the Macleay Museum, Sydney. PROC. LINN. SOC. N.S.W., iv, 1879, 38.
- Contributions to a Monograph of the Australian Leucosiidae. PROC. LINN. SOC. N.S.W., iv, 1879, 44.
- On Australian Amphipoda. PROC. LINN. SOC. N.S.W., iv, 1879, 245.
- Note on the Phyllosoma stage of *Ibacus Peronii* Leach. PROC. LINN. SOC. N.S.W., iv, 1879, 280.
- On some additional new genera and species of Amphipodous Crustaceans. PROC. LINN. SOC. N.S.W., iv, 1879, 319.
- On the Cyclostomatous Polyzoa of Port Jackson and Neighbourhood. PROC. LINN. SOC. N.S.W., iv, 1879, 350.

1880.

- Note supplementary to a paper on the Australian Leucosiidae. PROC. LINN. SOC. N.S.W., iv, 1879 (1880), 403.
- On the Australian Brachyura Oxyrhyncha. PROC. LINN. SOC. N.S.W., iv, 1879 (1880), 431.
- On some Polyzoa from the Queensland Coast. PROC. LINN. SOC. N.S.W., v, 1880, 33.
- On some new Amphipods from Australia and Tasmania. PROC. LINN. SOC. N.S.W., v, 1880, 97.
- On Australian Amphipoda (Abstract). *Ann. Mag. Nat. Hist.*, v, 1880, 30.
- On the Australian Brachyura Oxyrhyncha (Abstract). *Ann. Mag. Nat. Hist.*, v, 1880, 145.
- On two new species of the genus *Paratymolus* Miers (Crustacea Brachyura) from Australia (*P. vituberculatus*, *P. latipes*). *Ann. Mag. Nat. Hist.*, v, 1880, 302.

1881.

- On some new Australian Marine Isopoda. i. PROC. LINN. SOC. N.S.W., v, 1880 (1881), 470.
- On some new Australian Marine Isopoda. ii. PROC. LINN. SOC. N.S.W., vi, 1881, 181.
- Note on the occurrence on the coast of New South Wales of the genus *Mesenteripora* Bl. (Polyzoa Cyclostomata). PROC. LINN. SOC. N.S.W., vi, 1881, 199.
- On some new Australian Brachyura. PROC. LINN. SOC. N.S.W., vi, 1881, 540.

1882.

- Description of a new species of *Apseudes*. PROC. LINN. SOC. N.S.W., vi, 1881 (1882), 748.
- Description of some new species of Australian Decapoda. PROC. LINN. SOC. N.S.W., vi, 1881 (1882), 750.
- On the structure of the paired fins of *Ceratodus*, with remarks on the general theory of the Vertebrate limb. PROC. LINN. SOC. N.S.W., vii, 1882, 2.
- Note on the anatomy of two rare genera of pigeons. PROC. LINN. SOC. N.S.W., vii, 1882, 115.
- On Australian fresh-water Sponges. PROC. LINN. SOC. N.S.W., vii, 1882, 208.
- Note on the brain of the Tiger Shark (*Galeocерdo rayneri*). PROC. LINN. SOC. N.S.W., vii, 1882, 210.
- A monograph of the Australian Aphroditea. PROC. LINN. SOC. N.S.W., vii, 1882, 250.
- Note on some points in the anatomy of the pigeons referred to by Dr. Hans Gadow in a recent paper on the anatomy of *Pterocles*. PROC. LINN. SOC. N.S.W., vii, 1882, 397.
- On the structure and functions of the elytra of the Aphroditacean Annelids. *Ann. Mag. Nat. Hist.*, x, 1882, 238.
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